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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,947	06/27/2001	Solomon Trainin	42390.P10772	6304

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11/01/2005

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EXAMINER

CHEN, ALAN S

ART UNIT

PAPER NUMBER

2182

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/893,947	Applicant(s) TRAININ, SOLOMON	
	Examiner Alan S. Chen	Art Unit 2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☒ Claim(s) 3-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Dynamic network interface utilizing zero-copy frames".

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by US Pat. No. 6,434,620 to Boucher et al. (Boucher).
4. Per claim 1, Boucher discloses a method comprising: receiving a frame of data (Fig. 1, the intelligent NIC, element 50, receives frame of data over a network, Column 7, lines 4-10 disclose, "...network frames are processed on the INIC 50 through TCP.") transmitted across a network into a receiving buffer of a target computer system (Fig. 2 shows a buffer that stores header information from the received frames; Column 13, lines 28+ disclose frames stored in buffers in the INIC); recognizing and initiating a copy of said frame of data (Fig. 2, the INIC stores frames of data until the host passes back data buffer descriptors 96 which causes the INIC to subsequently copy/fill these buffers with the frames that the INIC has been storing, Column

13, lines 46-53), said initiating comprising identifying at least one available Application Memory (AM) buffer (the AM buffers are the buffers on the host that the data buffer descriptors, Fig. 2, element 96 describe to the INIC) in which to store a payload of said frame of data; storing a header of said frame of data to a Receiving Frame Descriptor (the RFD is represented by the elements in Fig. 2, elements 92 and 94, the Status and TCP/SMB header elements that “describe” the frame, Column 13, lines 44-55), said header comprising at least one sequence number (Column 13, lines 64-Column 14, lines 7 disclose the importance of keeping the order of which the data is written, further disclosing that the status word in Fig. 2, element 92 has 8 bits that keep track of the number of header buffers passed, Column 14, line 10; this meets the broad recitation of the header comprising a “sequence number”); zero-copying said payload of said received frame of data to said at least one AM buffer (Column 12, lines 11-25 disclose zero-copying, particularly using a fast-path to pass header information to the host and subsequently copying data received in the NIC to the host once the host sends information about host buffers to store the data, e.g., the application memory buffers).

5. Per claim 2, Boucher discloses claim 1, further being able to allocate new AM buffers (Column 13, lines 44-55, header information tells host to allocate necessary host buffers, e.g., AM buffers). The header information is from the Host Header Buffers, elements 92 and 94, construed to be the RBDs, which are created and added to based on incoming frames from the network. Boucher further discloses that in order to send frames from the NIC, a descriptor is filled with address and length of data to be transmitted (Column 12, lines 40-50), corresponding to the requisite buffer size required on the receiving end to hold the data.

Allowable Subject Matter

6. Claims 3,4,5-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is the statement of reasons for the indication of allowable subject matter: The prior art disclosed by the applicant and cited by the Examiner fail to teach or suggest, alone or in combination, *all* the limitations of the independent claim and dependent claim (claims 1 and 2), particularly aborting the zero-copy if an RBD entry is not identified (claims 3 and 4) as well as searching a pre-defined number of RBD's within the RBD queue for an RBD corresponding to an available AM buffer, as part of the identification process for an available AM buffer (claims 5-10).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to efficient network interface controllers using concepts related to zero-copying/reduced copying of frames:

U.S. Pat. No. 6,347,337 to Shah et al.

U.S. Pat. No. 6,247,060 to Boucher et al.

U.S. Pat. No. 6,907,042 to Oguchi


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan S. Chen whose telephone number is 571-272-4143. The examiner can normally be reached on M-F 8:30am - 5:30pm.

Art Unit: 2182

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim N. Huynh can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ASC
10/25/2005


KIM HUYNH
PRIMARY EXAMINER
10/25/05